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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/605,698	10/21/2003	Tao Lin	LN-9	2697

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EXAMINER

AN, SHAWN S

ART UNIT	PAPER NUMBER
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2621

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/12/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/605,698	Applicant(s) LIN, TAO	
	Examiner Shawn S. An	Art Unit 2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 10-18 and 20 is/are rejected.
- 7) ☒ Claim(s) 4-9 and 19 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>10/21; 12/29</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 12-17 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The recited "computer – implemented" is considered non-statutory subject matter.

Therefore, as far as merits of the claims 12-17, these claims will be examined in its entirety with the exception of the recited "computer – implemented".

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 20 recites the limitation "the current difference means" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Note: Dependent claim 19 does comprise the limitation "current difference means", of which the claim 19 has been objected (see below).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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6. Claims 1 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art in view of Kim et al (6,950,473) and Gonzales et al (5,001,559).

Regarding claim 1, Applicant's Admitted Prior Art discloses a MPEG decoder, comprising:

VLD (Fig. 4, 10) and IQ stage(s) (14) for outputting from the IQ, non-predicted DCT coefficients (Fig. 4, D(J,K)), the non-predicted DCT coefficients not adjusted for AC prediction of coefficients, wherein the VLD (Fig. 4, 10) and IQ stage(s) do not perform AC prediction of coefficients ([0018]-[0019];

an inverse DCT transformer (16)..., for generating pixels for a current block;

a mux (19) supplying the DCT coefficients to inverse DCT transformer (via 14), selecting the non-predicted DCT coefficients from VLD stage when AC prediction is not performed ([0018]-[0019]), but selecting predicted DCT coefficients for a first row/column in the current block when AC prediction is performed ([0020]-[0023]);

a coefficient store (18) for receiving DCT coefficients from the mux and for storing DCT coefficients for prior blocks as stored DCT coefficients; and

a pre-IQ calculator (24, 26), receiving the stored DCT coefficients from the coefficient store, and receiving the non-predicted DCT coefficients (E(J,K)) from the mux for generating the predicted DCT coefficients to the mux by performing pre inverse Q AC prediction, whereby AC prediction is performed on DCT coefficients input to the inverse DCT transformer before the IQ ([0020]-[0023]).

Applicant's Admitted Prior Art discloses substantially all of the claimed features with exceptions of receiving the non-predicted DCT coefficients from the IQ in the unified VLD/IQ stage, performing AC prediction after the inverse quantizer (post inverse Q AC prediction), and a post-IQ calculator.

However, Kim et al teaches a decoder comprising an unified VLD/IQ stage (Fig. 3, 31 + 33), to reduce blocking and ringing artifacts (Fig. 5b).

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Furthermore, Gonzales teaches a DCT decoder comprising performing AC prediction (Fig. 5c, 32") after the inverse quantizer (26) for improving the quality of decoded images, without any cost to compression efficiency in motion video applications.

Moreover, since Applicant's Admitted Prior Art discloses the pre-IQ calculator, the claimed post-IQ calculator is considered a mere location change, since the location change does not amount to a substantial function/operation (novelty) change (at least not in this claim).

Therefore, it would have been considered obvious to one of skill in the art employing Applicant's Admitted Prior Art to incorporate Kim et al's teaching so as to receive the non-predicted DCT coefficients (from the Applicant's prior art) from the IQ in the unified VLD/IQ stage for reducing blocking and ringing artifacts, and also incorporate Gonzales teaching as above so as to perform AC prediction after the inverse quantizer for improving the quality of decoded images, without any cost to compression efficiency in motion video applications.

Regarding claim 18, Applicant's Admitted Prior Art discloses a MPEG decoder, comprising:

parser means (Fig. 4, 20) for parsing an encoded bit-stream for an AC prediction flag for a current block and for extracting a current portion of the bit-stream for the current block;

means for decoding (10)..., with a VLD to generate Q DCT coefficients, and means for for IQing (14) the Q DCT coefficients with a current Qparameter (Qe) for the current block to generate output coefficients ([0018]-[0019]),

an inverse DCT transformer (16) for generating pixels for a current block from selected coefficients;

mux means (19) supplying the selected coefficients to inverse DCT transformer (via 14), for selecting as the selected coefficients of the VLD stage output coefficients when the AC prediction flag is false ([0018]-[0019]), and for

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selecting as the selected coefficients predicted coefficients for a first row or a first column when the AC prediction flag is true ([0020]-[0023]);

storage means (18) for storing the selected coefficients for prior blocks as stored DCT coefficients for the first row or the first column as stored coefficients, and for storing the current Qp as a stored quantization parameter ([0021]-[0022]); and

prediction means (24, 26) for generating the predicted coefficients for the first row or the first column when the AC prediction flag is true by combining the VLD output coefficients, the current Qp (Qe), a stored Qp (Qf) and stored coefficients for a prior block (from 18) to emulate AC prediction, whereby AC prediction is performed after IQ.

Applicant's Admitted Prior Art discloses substantially all of the claimed features with exceptions of selecting as the selected coefficients of the unified stage means output coefficients, performing AC prediction after the inverse quantizer, combining the unified stage output coefficients, and the preamble recitation "a computer usable medium ..., program code means ..., for decoding and AC predicted video bit-stream..., computer program product".

However, Kim et al teaches a decoder comprising an unified VLD/IQ stage (Fig. 3, 31 + 33), to reduce blocking and ringing artifacts (Fig. 5b), and methods/steps being embodied in a program of instructions which may be stored on a computer (col. 4, lines 1-9).

Furthermore, Gonzales teaches a DCT decoder comprising performing AC prediction (Fig. 5c, 32") after the inverse quantizer (26) for improving the quality of decoded images, and software (program) implementations of AC prediction formula, without any cost to compression efficiency in motion video applications.

Therefore, it would have been considered obvious to one of skill in the art employing Applicant's Admitted Prior Art to incorporate Kim et al and Gonzales' teachings as above so as to select as the selected coefficients of the unified

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stage means output coefficients and combine the unified stage output coefficients for reducing blocking and ringing artifacts, to perform AC prediction after the inverse quantizer for improving the quality of decoded images without any cost to compression efficiency in motion video applications, and to implement a computer program product comprising a computer usable medium ..., program code means ..., for decoding and AC predicting video bit-stream ..., computer program product for saving overhead costs associated with expensive hardware manufacturing.

7. Claims 2-3 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art, Kim et al, and Gonzales et al as applied to claim 1 above, and further in view of Jabbi et al (5,768,429).

Regarding claim 2, Kim et al teaches stored DCT coefficients in a coefficient store (Fig. 3, 37) are non-Q DCT coefficients, and Gonzales et al teaches the non-Q DCT (IQ) coefficients to the IDCT (Fig. 5c, 11) are used for AC prediction (32") (in reverse analogy, Q DCT coefficients are not used for AC prediction).

The combination of Applicant's Admitted Prior Art, Kim et al, and Gonzales et al does not seem to disclose sending Q DCT coefficients from the VLD to IQ without outputting the Q DCT coefficients.

However, Jabbi et al teaches sending Q DCT coefficients from the VLD to IQ without outputting the Q DCT coefficients for accelerating video decompression by performing operations in parallel.

Therefore, it would have been considered obvious to one of skill in the art employing Applicant's Admitted Prior Art to incorporate Jabbi et al's teaching so as to send Q DCT coefficients from the VLD to IQ without outputting the Q DCT coefficients for accelerating video decompression by performing operations in parallel.

Regarding claim 3, Applicant's Admitted Prior Art discloses substantially discloses all of the claimed features (see [2000]-[0023]).

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Regarding claim 10, Applicant's Admitted Prior Art discloses current block containing 64 pixels in 8 rows and 8 columns represented by 64 DCT coefficients (8x8 block)([0018]-[0019]).

Regarding claim 11, Applicant's Admitted Prior Art discloses no AC prediction being performed on 8x8 block's coefficients (comprises a first coefficient in the first row and in the first column)([0018]).

Allowable Subject Matter

8. Claims 4-9 and 19 are objected to as being dependent upon rejected base claims 1 and 18, respectively, but would be allowable:

if claim 4 is rewritten in independent form including all of the limitations of the base claim 1 and any intervening claims; and

if claim 19 is rewritten in independent form including all of the limitations of the base claim 18 and any intervening claims.

Dependent claims 4 and 19 recite novel features (emphasis added on the entire claim(s) limitations as a whole), wherein the prior art of record fails to anticipate or make obvious the novel features.

Accordingly, if the amendments are made to the claims listed above, and if rejected claim is canceled, the application would be placed in condition for allowance.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to *Shawn S. An* whose telephone number is 571-272-7324.

10. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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11. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



SHAWN AN
PRIMARY EXAMINER

3/1/07